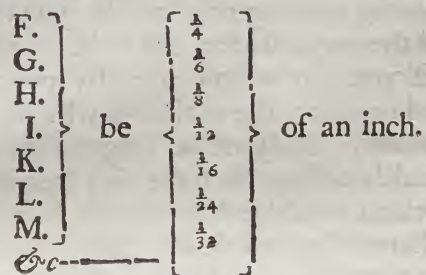


*round Spring* (the way of making which trials is *obvious* enough.) And with the fluid bodies of *Mercury, Air, &c.* the way of trying which, will be somewhat more difficult; and therefore I shall in brief describe it. He therefore that would try with *Air*, must first be provided of a *Glass-pipe*, made of the shape of that in the *fifth Figure*, whereof the side A B, represents a straight *Tube* of about three foot long, C, represents another part of it, which consists of a *round Bubble*; so ordered, that there is left a *passage or hole* at the top, into which may be fastened with *cement* several *small Pipes* of determinate *cylindrical cavities*: as let the *hollow* of



There may be added as many more, as the Experimenter shall think fit, with holes continually decreasing by known quantities, so far as his senses are able to help him; I say, so far, because there may be made *Pipes* so small that it will be impossible to perceive the *perforation* with ones naked eye, though by the help of a *Microscope*, it may easily enough be perceived: Nay, I have made a *Pipe* perforated from end to end, so small, that with my naked eye I could very hardly see the body of it, insomuch that I have been able to knit it up into a knot without breaking: And more accurately examining one with my *Microscope*, I found it not so big as a sixteenth part of one of the smaller hairs of my head which was of the smaller and finer sort of hair, so that sixteen of these *Pipes* bound fagot-wise together, would but have equalized one single hair; how small therefore must its *perforation* be? It appearing to me through the *Microscope* to be a proportionably *thick-sided Pipe*.

To proceed then, for the trial of the Experiment, the Experimenter must place the *Tube* A B, perpendicular, and fill the *Pipe* F (cemented into the hole E) with water, but leave the *bubble* C full of *Air*, and then gently pouring in water into the *Pipe* A B, he must observe diligently how high the water will rise in it before it protrude the *bubble* of *Air* C, through the narrow passage of F, and denote exactly the height of the *Cylinder* of water, then cementing in a second *Pipe* as G, and filling it with water; he may proceed as with the former, denoting likewise the height of the *Cylinder* of water, able to protrude the *bubble* C through the passage of G, the like may he do with the next *Pipe*, and the next, &c. as far as he is able: then comparing the several heights of the *Cylinders*, with the several *holes* through which each *Cylinder* did force the *air* (having due regard to the *Cylinders* of water in the small *Tubes*) it will be very easie to determine, what force is requisite to press the *Air* into such and such a *hole*, or (to apply it to our present experiment) how

how much of the pressure of the *Air* is taken off by larger and smaller *holes*. From the application of water into the bigger *hole* of the *Vessel*, and into the *Pipe*, we shall clearly find, that there is a greater pressure of the water in the *Vessel* or greater *pipe*, then there is in the *pipe*: For since the pressure of the *air* every way is that is, as much as is able to press up and sustain a *Cylinder* of two foot and a half high, or thereabouts; And so many more degrees are required to force the *Air* into a greater *hole* that is full of a more congruous fluid, since those degrees that are requisite to press it in, from the *Air* within, and the *Air* within left with pressure less then the *Air* without; it will follow, that the *Tube* or *pipe*, will have less pressure against the fluid therein, then the *Air* in the bigger: which was to be proved.

The Conclusion therefore will necessarily follow, that the equal pressure of the *Air* caused by its ingress into unequal *holes* is sufficient to produce this effect, without the help of any other force: therefore is probably the principal (if not the only) *cause*.

This therefore being thus explained, there will be explicable thereby, as, the rising of *Liquors* in a *Filter* of *Wine, Oyl, melted Tallow, &c.* in the *Week* of a *Leaf* of small *Wire, Threds* of *Asbestos, Strings* of *Glass*, or of *Liquors* in a *Sponge, piece* of *Bread, Sand, &c.* percolating of the *Sap* in *Trees* and *Plants*, through their small imperceptible *pores*, (of which I have said more, on another occasion) at least the passing of it out of the earth into their roots on the consideration of this Principle, multitudes of things curr'd to me, which I have not yet so well examined, and propound for *Axioms*, but only as *Queries* and *Conjectures* serve as *hints* toward some further *discoveries*.

As first, Upon the consideration of the congruity and adhesion, as to touch, I found also the like congruity and adhesion (so speak) as to the Transmitting of the *Raies* of Light, from *water* (not now to mention other *Liquors*) to *Glass* then *Air*, and *Air* then *Quicksilver*: whereof *Glass*, will pass into *water* with very little refraction, but none out of *Glass* into *Air*, excepting a direct ray, a very great refraction from the perpendicular, nay under thirty degrees, will not be admitted into the *Air*, *Quicksilver* will neither admit oblique or direct, but reflects the transmitting of the *Raies* of Light, to be of a quality different from that of *Air, Water, Glass, &c.* and to reflect on concave and strong reflecting bodies of *Metals*: So also cohesion or congruity, *Water* seems to keep the